

Remarks:

Reconsideration of the application is requested.

Claims 1-3 remain in the application. Claim 1 has been amended.

In item 1 on page 2 of the above-identified Office action, claims 1-3 have been rejected as being obvious over *Pike, Jr. et al.* (US Patent No. 5,528,058) in view of *Schulz et al.* (US Patent No. 5,357,130) and *Lewis* (US Patent No. 4,881,979) under 35 U.S.C. § 103.

As will be explained below, it is believed that the claims were patentable over the cited art in their original form and the claims have, therefore, not been amended to overcome the references.

However, claim 1 was amended by adding the word "and" to the end of the second-last paragraph of claim 1. Also the word "both" has been added to the last paragraph to remove any possible ambiguity. These changes are neither provided for overcoming the prior art nor do they narrow the scope of the claim for any reason related to the statutory requirements for a patent.

The Examiner stated on page 3 of the Office action that "it would have been obvious ... to modify the device [cf *Pike, Jr. et al.*?] so as to include the use of ... foreign atoms in the stop zone ... having ionization energies meV apart from both conduction band and valence band." Applicants respectfully disagree for the reasons outlined below.

The underlying inventive concept of the invention of the instant application is that the stop zone needs to be "active" only in the off state but not during its conducting operation. In other words, the number of effective doping atoms generated by the disruption in the stop zone should change in dependence on the type of operation of the circuit element. This is achieved in the invention of the instant application by creating energy levels, by doping with atoms, which, within the band gap of the semiconductor material, lie far away from the energy levels of both the conductance band and the valence band. None of the applied references suggest a stop zone which is active only during the off state but not during its conducting state. Also none of the applied references suggest creating energy levels, by doping with atoms, which, within the band gap of the semiconductor material, lie far away from the energy levels of both the conductance band and the valence band. Therefore, the invention as recited in claim 1 of the instant application is believed not to be obvious over *Pike, Jr. et al.* in view of *Scholz et al.* and *Lewis*.

The device disclosed in *Lewis* uses gallium-arsenate as substrate material. The behavior and the energy levels of sulfur and selenium as doping atoms to the conduction band and the valence band of the GaAs-substrate material is entirely different than the energy levels of sulfur and selenium within a silicon-based substrate material. *Scholz et al.* uses doping atoms with a high ionization energy for providing a basic doping of the complete device. In contrast, in the instant application only the stop zone is doped with doping atoms of a high ionization energy.

The current standard for combinability requires a showing of combinability which is "clear and particular". *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340 (January 27, 2000), rehearing en banc denied (March 6, 2000), cert. denied, 120 S. Ct. 2679 (U.S. 2000). There is no showing that it would be "clear and particular" to combine *Pike, Jr. et al.*, *Scholz et al.* and *Lewis*, considering that none of the references disclose or suggest the inventive concept and/or its actual implementation in the invention of the instant application, as recited in claim 1.

It is accordingly believed to be clear that *Pike, Jr. et al.* in view of *Scholz et al.* and *Lewis* do not suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art and since claims 2-3 are ultimately dependent on claim 1, they are believed to be patentable as well.

In view of the foregoing, reconsideration and allowance of claims 1-3 are solicited.

Please charge any fees which might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of *Lerner and Greenberg, P.A.*, No. 12-1099.

Respectfully submitted,



For Applicants

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Version with markings to show changes made:

Claim 1 (amended). A power semiconductor element, comprising:

an emitter region;

a stop zone in front of the emitter region;

said emitter region and said stop zone having mutually
opposite conductivities; and

said stop zone having foreign atoms with at least one energy
level within the band gap of the semiconductor and at least
200 meV away from both a conduction band and a valence band of
the semiconductor.